**Computing Basics**

The first computers were used primarily for numerical calculations. However, as any information can be numerically encoded, people soon realized that computers are capable of general-purpose information processing. Their capacity to handle large amounts of data has extended the range and accuracy of weather forecasting. Their speed has allowed them to make decisions about routing telephone connections through a network and to control mechanical systems such as automobiles, nuclear reactors, and robotic surgical tools. They are also cheap enough to be embedded in everyday appliances and to make clothes dryers and rice cookers “smart.” Computers have allowed us to pose and answer questions that could not be pursued before. These questions might be about DNA sequences in genes, patterns of activity in a consumer market, or all the uses of a word in texts that have been stored in a database. Increasingly, computers can also learn and adapt as they operate.

**Definition - What does *Computer* mean?**

A computer is a machine or device that performs processes, calculations and operations based on instructions provided by a software or hardware program. It has the ability to accept data (input), process it, and then produce outputs. Computers can also store data for later uses in appropriate storage devices, and retrieve whenever it is necessary.

Modern computers are electronic devices used for a variety of purposes ranging from browsing the web, writing documents, editing videos, creating applications, playing video games, etc. They are designed to execute applications and provide a variety of solutions by combining integrated hardware and software components.

The earliest digital electronic device that could be defined as the first modern computer is the Colossus. Built in 1943-44, the Colossus was devised to crack the Lorenz SZ 40/42, a German encryption machine used to support military communications during World War II. The device used 2,400 vacuum tubes to perform multiple boolean logical operations to decode encrypted data.

Modern computers come in all shapes and sizes to perform a broad range of different functions. Although the first ones that come to mind are desktop and laptop computers, many other less-assuming devices — such as grocery scanners, ATMs, and smart TVs — are computers as well. The diffusion of smartphones, game consoles, wearables, and smart appliances made computers much more readily available in our daily life.

A computer is made up of multiple parts and components that facilitate user functionality.

A computer has two primary categories: hardware and software.

**1. Hardware**

Physical structure that houses a computer's processor, memory, storage, communication ports and peripheral devices. Each of these components (called devices) have a different purpose, which may be either accepting inputs, storing data or sending outputs. For example, a mouse and a microphone are input devices used to record user activities and transform them into data that is transmitted to the system unit. A hard disk is a storage unit where data is stored and accessed by other devices. A monitor or a speaker are output devices that transform processed data into (respectively) video and audio signals.

Usually, the core components that represent the bare minimum that allow a computer to function are:

**Processor (CPU) –** The component that processes and executes inputs received from hardware and software.

**Motherboard –** A mainboard that provides basic connection between all the other hardware components and devices (internal and external).

**Memory (RAM) -** A temporary data storage space that stores the information the CPU is actively using.

**Storage device –** A storage device where data is stored on a permanent basis. It’s slower but less volatile than the RAM.

**Power supply unit –** That’s pretty self-explanatory: without power, no electronic device can work!

**2. Software**

All parts of a computer that are not strictly physical, such as data, programs, applications, protocols, etc., are broadly defined as “software.” Although software has no material form, it is no less critical to receive information, encode, store and process it. Computer software includes all executable and non-executable data, such as documents, digital media, libraries, and online information. A computer’s operating system (OS) and all its applications are software as well. A computer works with software programs that are sent to its underlying hardware architecture for reading, interpretation and execution.

Computers are classified according to computing power, capacity, size, mobility and other factors, as personal computers (PC), desktop computers, laptop computers, minicomputers, handheld computers and devices, mainframes or supercomputers.